CUSP9* treatment protocol for recurrent glioblastoma: aprepitant, artesunate, auranofin, captopril, celecoxib, disulfiram, itraconazole, ritonavir, sertraline augmenting continuous low dose temozolomide.

Kast RE¹, Karpel-Massler G², Halatsch ME².

Author information

¹IIAIGC Study Center, Burlington, VT, USA.
²University of Ulm, Department of Neurosurgery, Albert-Einstein-Allee 23, Ulm, Germany.

Abstract

CUSP9 treatment protocol for recurrent glioblastoma was published one year ago. We now present a slight modification, designated CUSP9*. CUSP9* drugs- aprepitant, artesunate, auranofin, captopril, celecoxib, disulfiram, itraconazole, sertraline, ritonavir, are all widely approved by regulatory authorities, marketed for non-cancer indications. Each drug inhibits one or more important growth-enhancing pathways used by glioblastoma. By blocking survival paths, the aim is to render temozolomide, the current standard cytotoxic drug used in primary glioblastoma treatment, more effective. Although esthetically unpleasing to use so many drugs at once, the closely similar drugs of the original CUSP9 used together have been well-tolerated when given on a compassionate-use basis in the cases that have come to our attention so far. We expect similarly good tolerability for CUSP9*. The combined action of this suite of drugs blocks signaling at, or the activity of, AKT phosphorylation, aldehyde dehydrogenase, angiotensin converting enzyme, carbonic anhydrase -2,- 9, -12, cyclooxygenase-1 and -2, cathepsin B, Hedgehog, interleukin-6, 5-lipoxygenase, matrix metalloproteinase -2 and -9, mammalian target of rapamycin, neurokinin-1, p-gp efflux pump, thioredoxin reductase, tissue factor, 20 kDa translationally controlled tumor protein, and vascular endothelial growth factor. We believe that given the current prognosis after a glioblastoma has recurred, a trial of CUSP9* is warranted.


LinkOut - more resources

PubMed Commons

0 comments

How to join PubMed Commons